DRAFT
Connecticut Path to Clean Fuels and Clean Vehicles

Connecticut Department of Energy and Environmental Protection

January 2014

Commitment

Comprehensive Energy Strategy

Energy

Economy

By integrating energy, environmental, and economic goals, the Strategy breaks new ground and advances a broad and robust structure for thinking through energy options.

Emphasis is placed not on “picking winners” but on using limited government resources to leverage private capital and increase the flow of funds into energy efficiency, renewable power, natural gas availability, and a 21st century transportation infrastructure that promotes mobility options, transportation-oriented development, and market-based opportunities for clean fuels and clean vehicles.

Environment

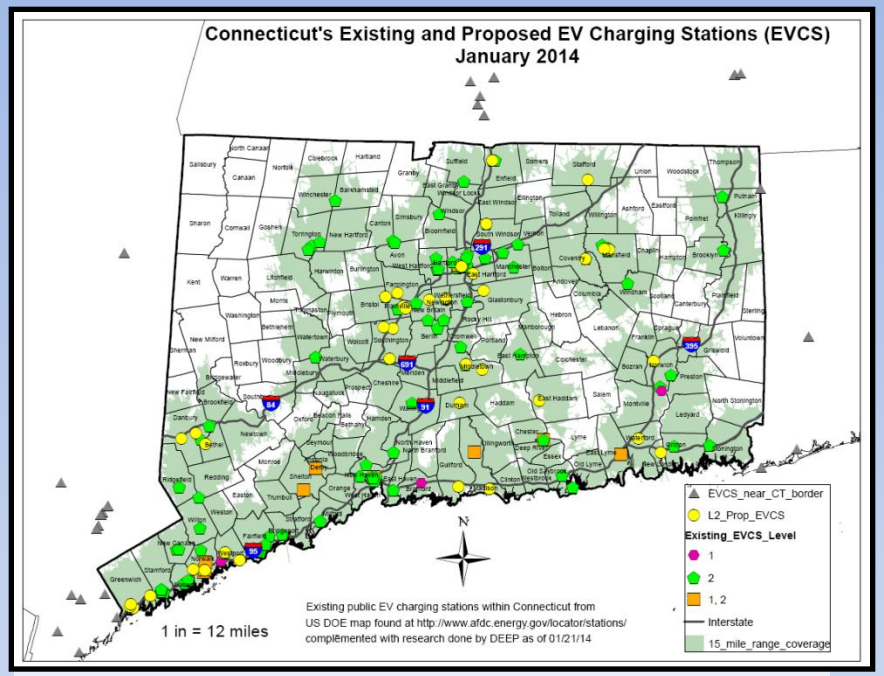
CT Actions Underway to Grow the Market

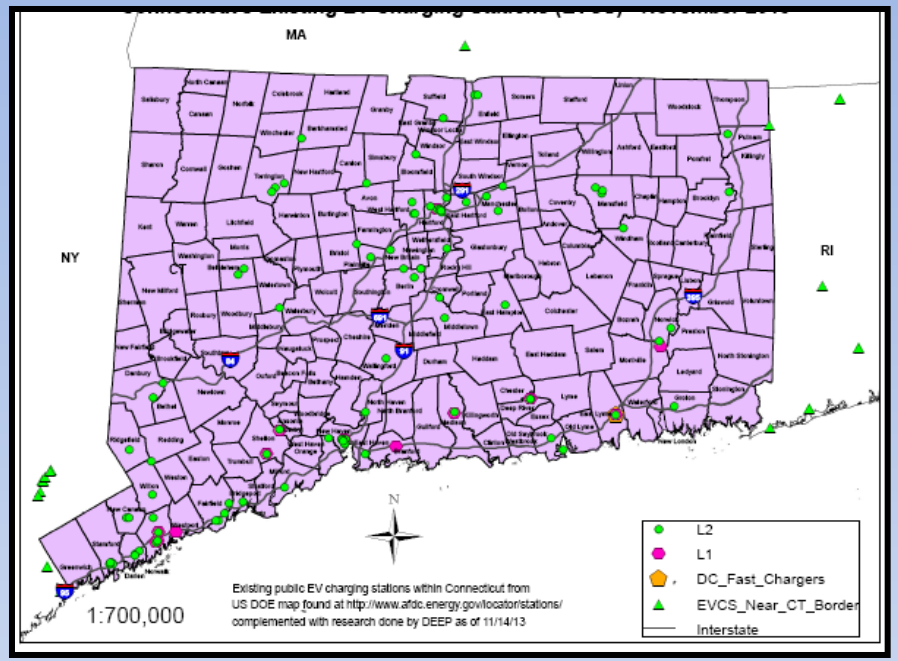
Significant Activity Under Way

- Build out publically recognizable infrastructure to assure range confidence
- Develop workplace charging education and technical assistance program
- DEEP workplace charging, leading by example
- Assess potential fleet wins
- Engage, through CCAT, in DOE public/private H2USA Initiative
- ZEV Dealer Recognition Program

- Assess HOV access for Plug-ins
- Prioritize site for chargers at commuter lots and transportation hubs
- Install fast chargers along the interstate corridor

EVConnecticut





What We Have

160 chargers at 100 locations around the state

Our Goal

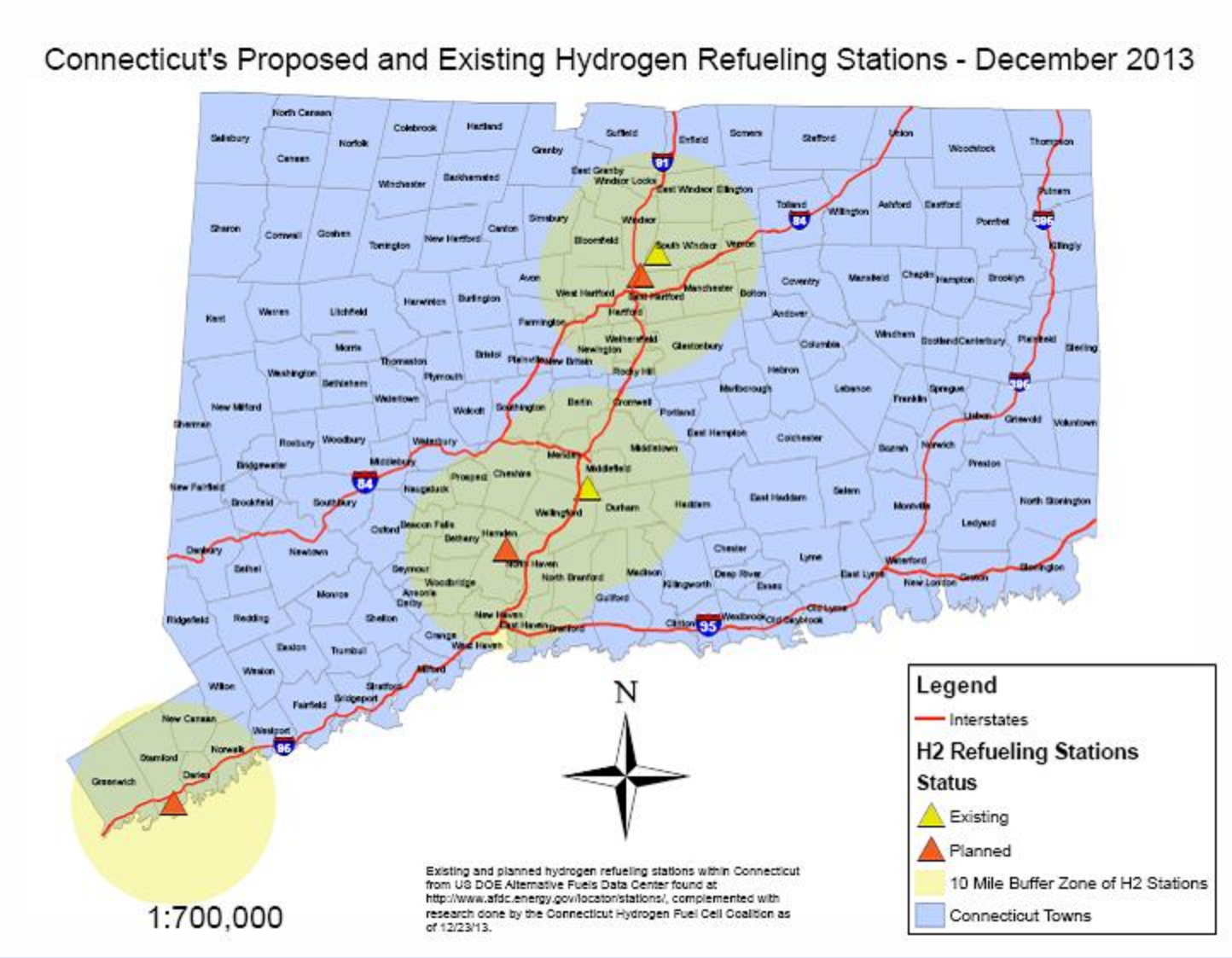
Chargers within a 15 mile range anywhere in state

Connecticut's Current Strategy

- Chargers at homes, workplaces, and multi-modal transportation hubs
- Safe and convenient chargers near destinations (food, shopping)
- Fast chargers along interstate transportation arteries

EVconnecticut
electric vehicle charging solutions

Connecticut Proposed and Existing Hydrogen Stations



Source: CCAT

ZEV Memorandum of Understanding

On October 24, 2013 Governor Malloy and Governors from seven other states signed an MOU agreeing to put 3.3 million zero emission vehicles (ZEVs) on the road in the eight signatory states by 2025

Strategy

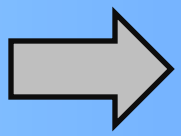
- Create an Action Plan
- Develop annual reports for the number of ZEVs registered in CT
- Work with Energy Planners to develop equitable electric rate structure necessary for widespread ZEV deployment
- Evaluate ZEVs for fleet use
- Align building codes and standards to facilitate ZEV infrastructure
- Evaluate opportunities to deploy hydrogen fuel cell electric vehicles

Achieving MOU Goals

EVconnecticut
electric vehicle charging solutions

Statewide Public Charging Network
Public Information Website
Dealer Awards
California Low Emission Vehicle Program

Action Plan Implementation

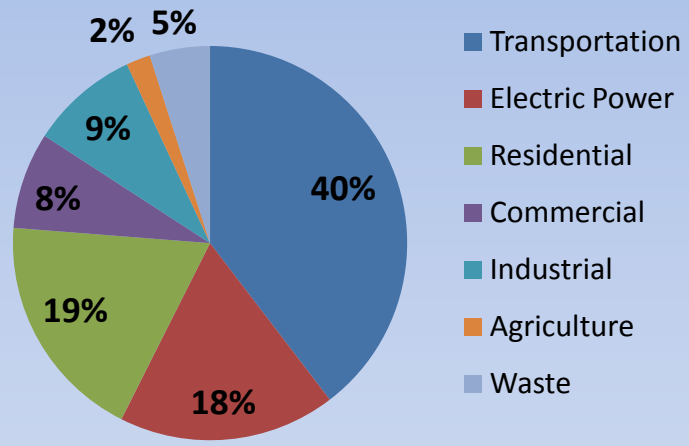


MOU Goals

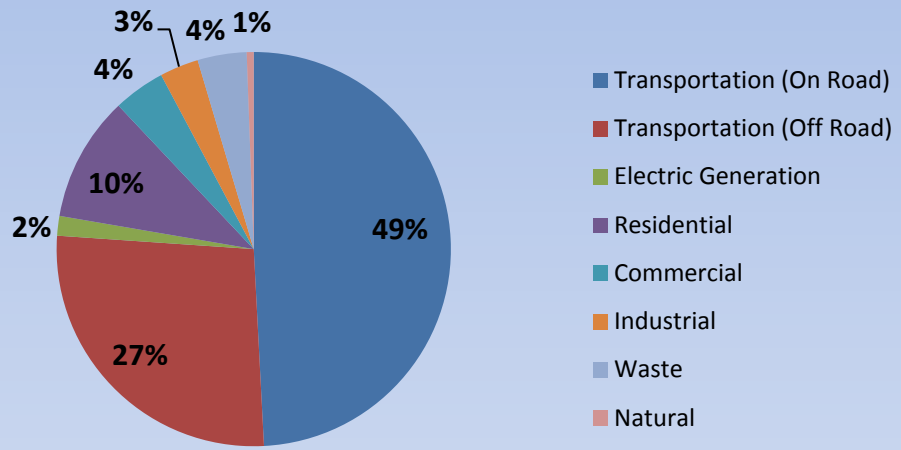
Background

Transportation Sector is the Largest Source of Emissions

2010 Annual CO_2 Emissions by Sector (SIT)



2011 NO_x Emissions (NEI)



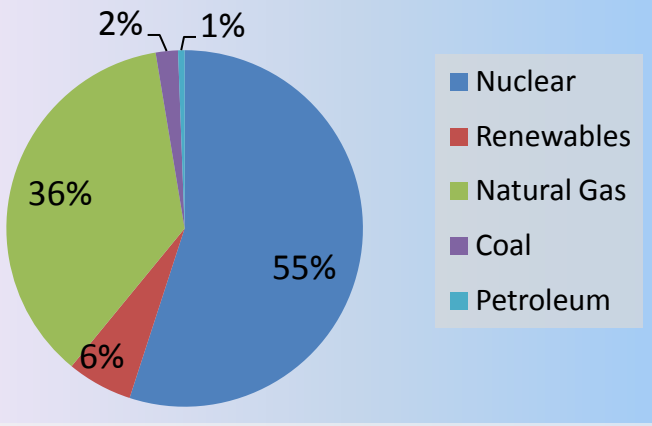
In Connecticut, mobile sources account for 40% of all CO_2 emissions

In Connecticut, on road vehicles account for 49% of all NO_x emissions

Conventional vehicles are getting cleaner due to the Low Emission Vehicle program, but people are also driving more miles

Connecticut's Clean Energy Should Be Leveraged in Transportation

Fuel Sources for Electric Power Generation in Connecticut in 2012 (EIA)



USA Average	Connecticut
• 0.46 lbs. CO_2e/mile	• 0.24 CO_2e/mile

Connecticut has the 5th cleanest energy production for CO_2 emissions in the country, making electric vehicles (EVs) significantly better for than environment than conventional vehicles.

Climate Central Report 2013

The CO_2e emissions of EVs are lower in Connecticut than the national average.

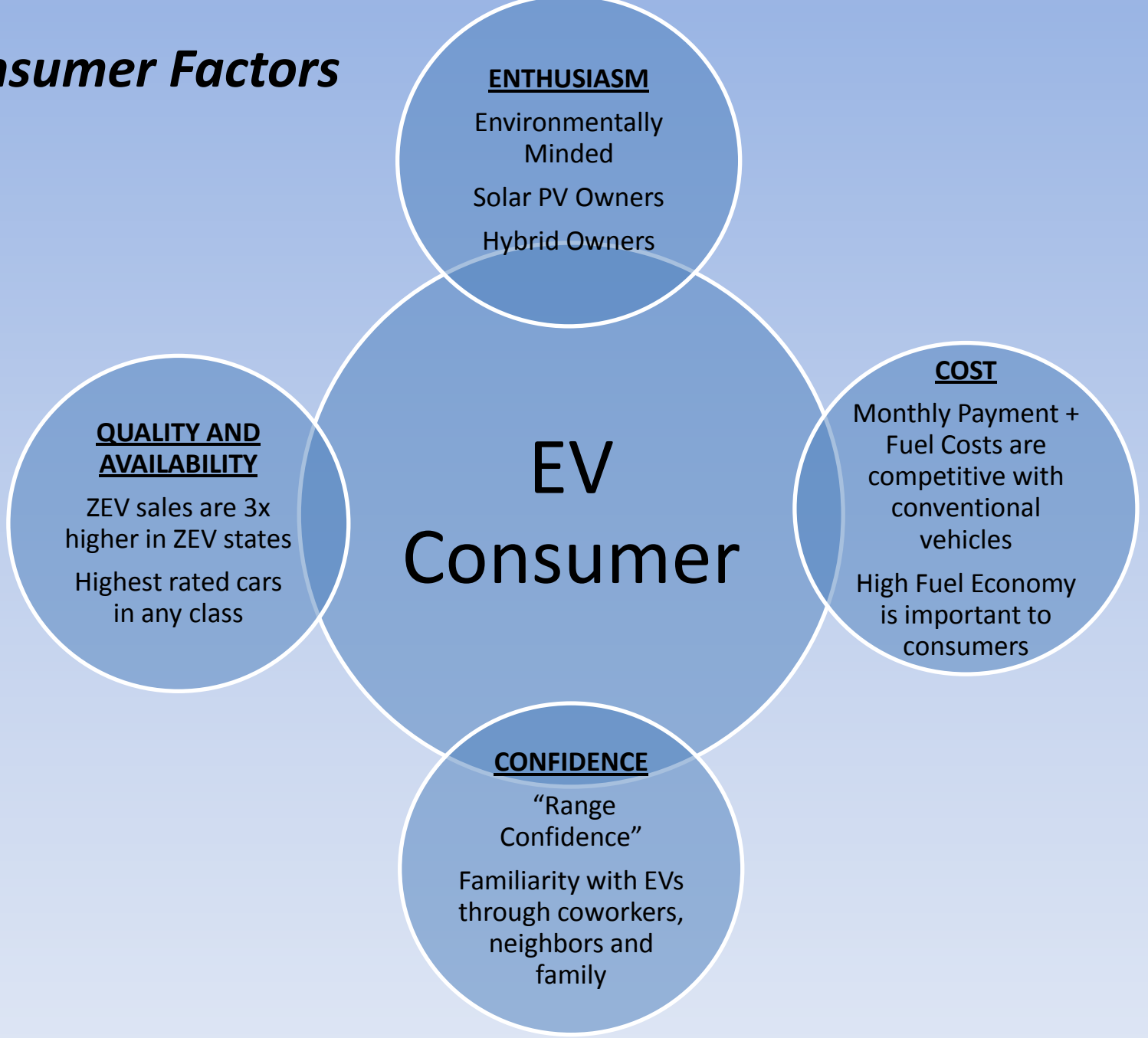
Consumer Choice

In 2002, there were only three hybrid vehicle models commercially available for sale in the United States; ten years later there are 38.

In 2006, there were no plug-in electric vehicles on the market in the United States; only six years later there are 13 different models.

Why do Consumers Choose Electric Vehicles?

EV Consumer Factors



Total Cost of Ownership

EVs compare favorably to conventional vehicles.

Initial Price

- **Federal Incentives can be used to reduce initial cost**

Fuel

- **Fuel costs for EV's in CT will be closer to $1.60 to $2.00 gasoline equivalent**

Insurance

- **Many insurance companies offer discounts of up to 5% for EV owners**

Taxes

- **Consider property tax, sales tax and administration fees**

Maintenance

- **Maintenance costs for EVs have been found to be up to 35% lower than for conventional vehicles**

Total Cost of Ownership

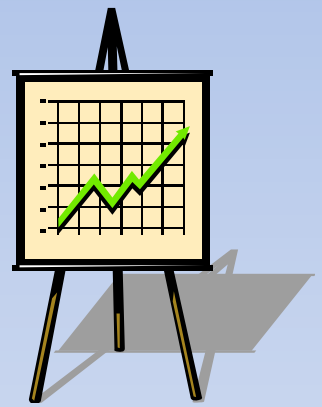
Availability

Availability

Many of the ZEV Models are currently only available in CA

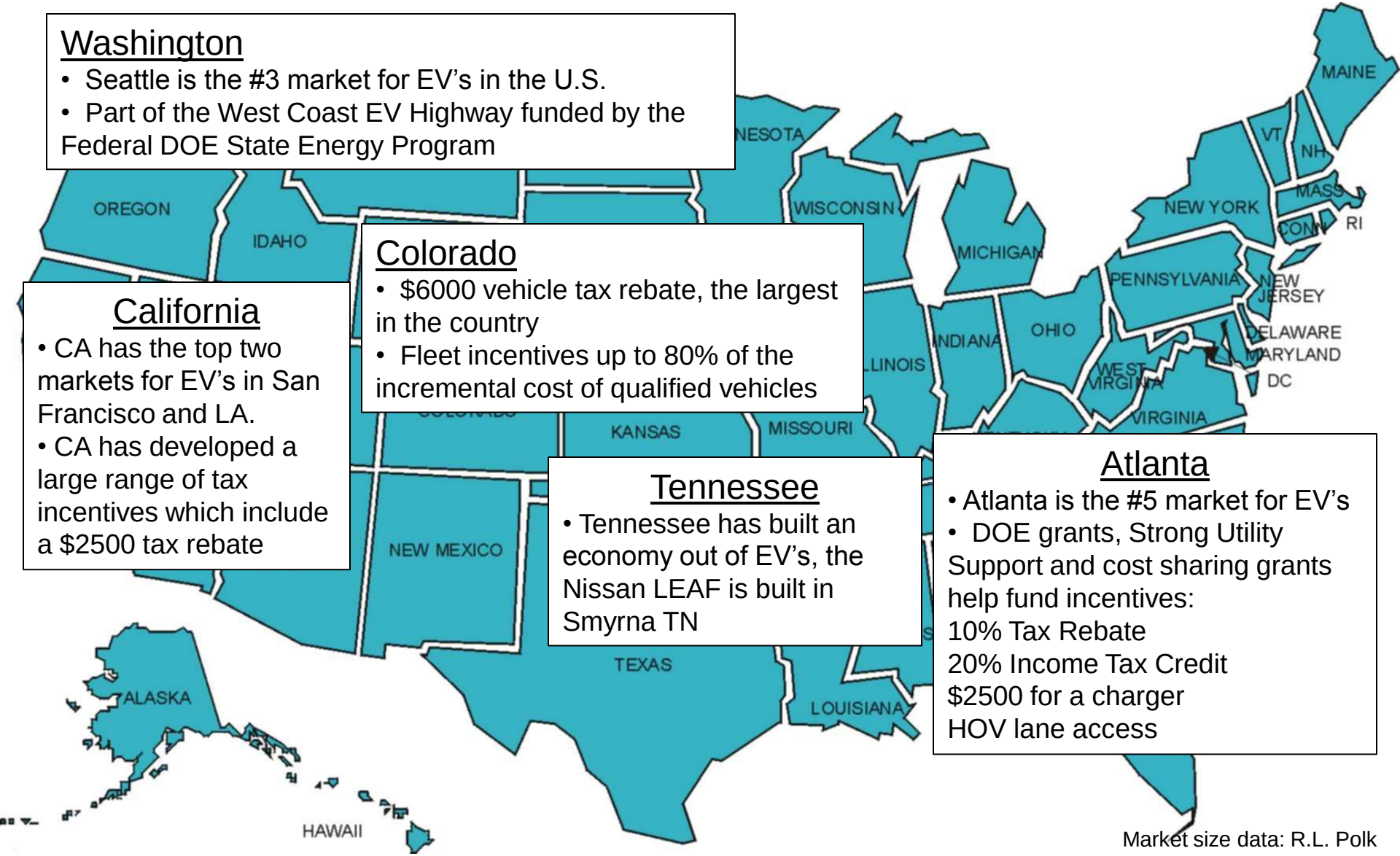
Plug-in sales are three times higher in states that have adopted the California Low Emission Vehicle and Zero Emission Vehicle program.

Some automakers will begin deploying Fuel Cell Electric Vehicles (FCEV) in the United States in the 2015 model year.



Incentives in Other States

Who is Providing Incentives?



Washington

- Seattle is the #3 market for EV's in the U.S.
- Part of the West Coast EV Highway funded by the Federal DOE State Energy Program

Colorado

- $6000 vehicle tax rebate, the largest in the country
- Fleet incentives up to 80% of the incremental cost of qualified vehicles

California

- CA has the top two markets for EV's in San Francisco and LA.
- CA has developed a large range of tax incentives which include a $2500 tax rebate

Tennessee

- Tennessee has built an economy out of EV's, the Nissan LEAF is built in Smyrna TN

Atlanta

- Atlanta is the #5 market for EV's
- DOE grants, Strong Utility Support and cost sharing grants help fund incentives:

10% Tax Rebate
20% Income Tax Credit
$2500 for a charger
HOV lane access

Market size data: R.L. Polk

Action Plan Strategies

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ZEVs can be a foundation CT's Economy and Job Growth

- Connecticut is home to several companies directly involved in advanced technology vehicle industry

- ZEV's have the potential to increase jobs in EV and H2 related industries

- Companies in Connecticut can save money by utilizing ZEV vehicles in their fleets

Action Plan Strategy

- Work with the Connecticut Center for Advanced Technology and ZEV partners
- Showcase business success stories and expertise
- Partner with the Connecticut Department of Economic and Community Development to assess ZEV impact on the economy

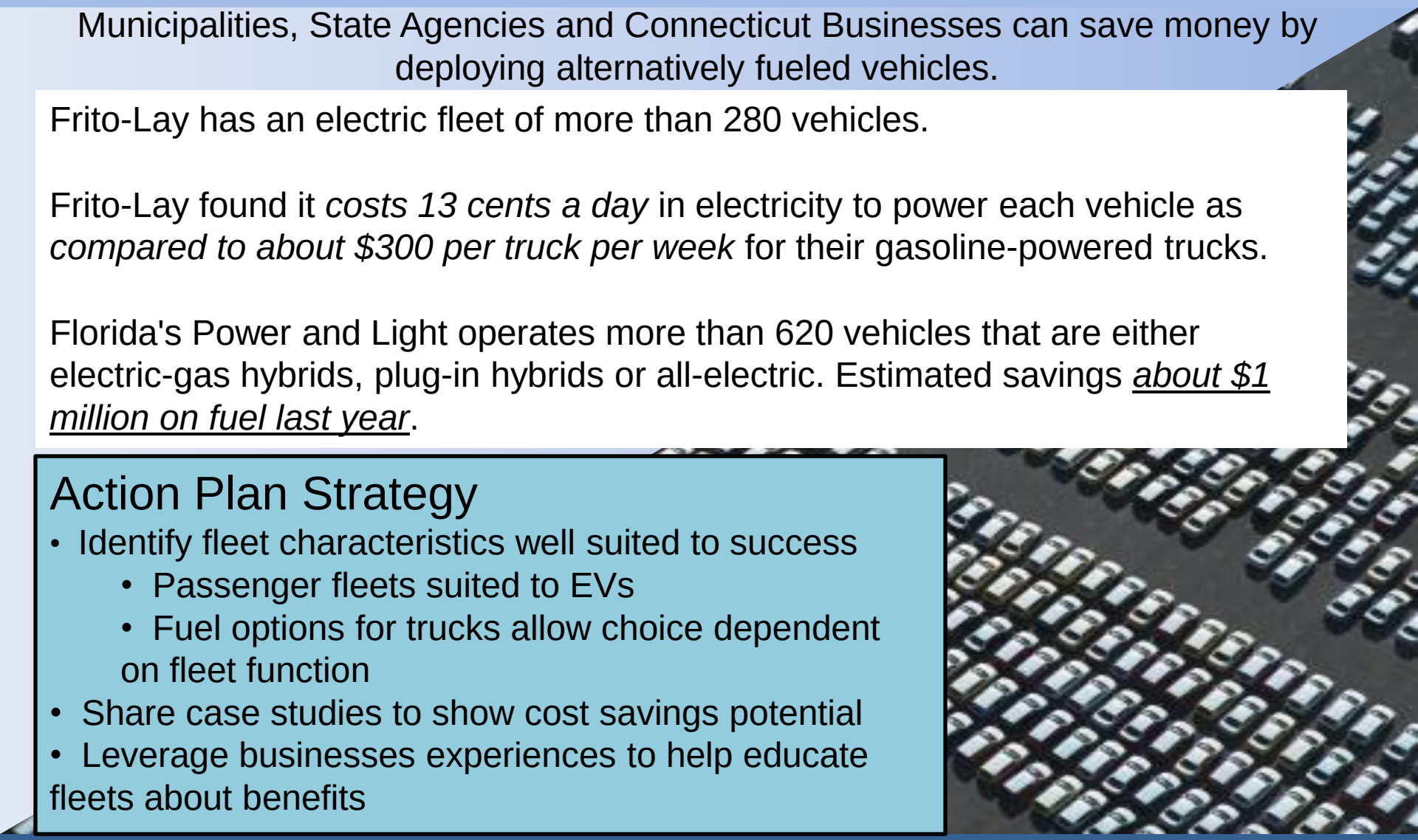
Fleets/ Employers are Key

Municipalities, State Agencies and Connecticut Businesses can save money by deploying alternatively fueled vehicles.

Frito-Lay has an electric fleet of more than 280 vehicles.

Frito-Lay found it *costs 13 cents a day* in electricity to power each vehicle as *compared to about $300 per truck per week* for their gasoline-powered trucks.

Florida's Power and Light operates more than 620 vehicles that are either electric-gas hybrids, plug-in hybrids or all-electric. Estimated savings *about $1 million on fuel last year*.



Action Plan Strategy

- Identify fleet characteristics well suited to success
  - Passenger fleets suited to EVs
  - Fuel options for trucks allow choice dependent on fleet function
- Share case studies to show cost savings potential
- Leverage businesses experiences to help educate fleets about benefits

Lead by Example

Assure building codes facilitate the EV future.

Action Plan Strategy

- Complete DEEP Lean exercise to create a standard procedure for state facility charger installation
- Put chargers on the state procurement contract for municipal and state agency procurement
- Assess best practices for state building codes

Electric Rates to Facilitate ZEV Market

At the heart of Connecticut's Comprehensive Energy Strategy are policy proposals aimed at expanding energy choices, lowering utility bills for Connecticut residents and businesses, improving environmental conditions, creating clean energy jobs, and enhancing the quality of life in the State.

Action Plan Strategy

- Assess best practices in other states
- Increase marketing and public awareness on available rates and metering options for EVs
- Finalize EV rates docket to further support deployment and implementation as outlined in the CES

PURA actions in 2014 will include:

1. Implementing a pilot program of interim time of day rates for public EV charging stations to inform rate design efforts.
2. Determining the appropriateness of implementing time of day rates for public EV charging stations.
3. Determining the appropriateness of time of day rates for other customer classes.

Potential Federal Opportunities

Assess viability of federal authorization to allow plug-in vehicles in HOV lanes.

U.S. Department of Transportation
Federal Highway Administration

Pursue FHWA authorization to allow chargers at rest stops.

Assess possibility of extending and converting Federal tax credit to point of sale rebate.

U.S. DEPARTMENT OF ENERGY

Streamline Standards for Hydrogen Fueling

Hydrogen Infrastructure

<u>Establish Goals</u>

- Development of Infrastructure
- Vehicle Deployment

<u>Establish Hydrogen Partnerships</u>

- Automakers
- Hydrogen Producers and Distributors
- Government
- Equipment Manufacturers

Action Plan Strategy

- Assess hydrogen fueling infrastructure needs
- Coordination with stakeholders
- Implement H2 Roadmap Deployment Plan

Action Plan Strategies Summary

Infrastructure
- Safe and convenient chargers near consumer amenities (food, shopping)
- Fast chargers along interstate transportation arteries
- Chargers at homes, workplaces, and multi-modal transportation hubs

Electric Utility Rates and Policy
- Assess best practices in other states
- Increase marketing and public awareness on available rates and metering options of EVs
- Finalize EV rates docket to further support deployment and implementation as outlined in the CES

Fleets
- Identify fleet characteristics well suited to success
- Share case studies to show cost savings potential
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Leveraging CT Industry in ZEV Development
- Work with the Connecticut Center for Advanced Technology and ZEV partners
- Showcase business success stories and expertise
- Partner with the Connecticut Department of Economic and Community Development to assess ZEV impact on the economy

Lead by Example
- Complete DEEP Lean exercise to create a standard procedure for state facility charger installation
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ZEV Regional Action Plan

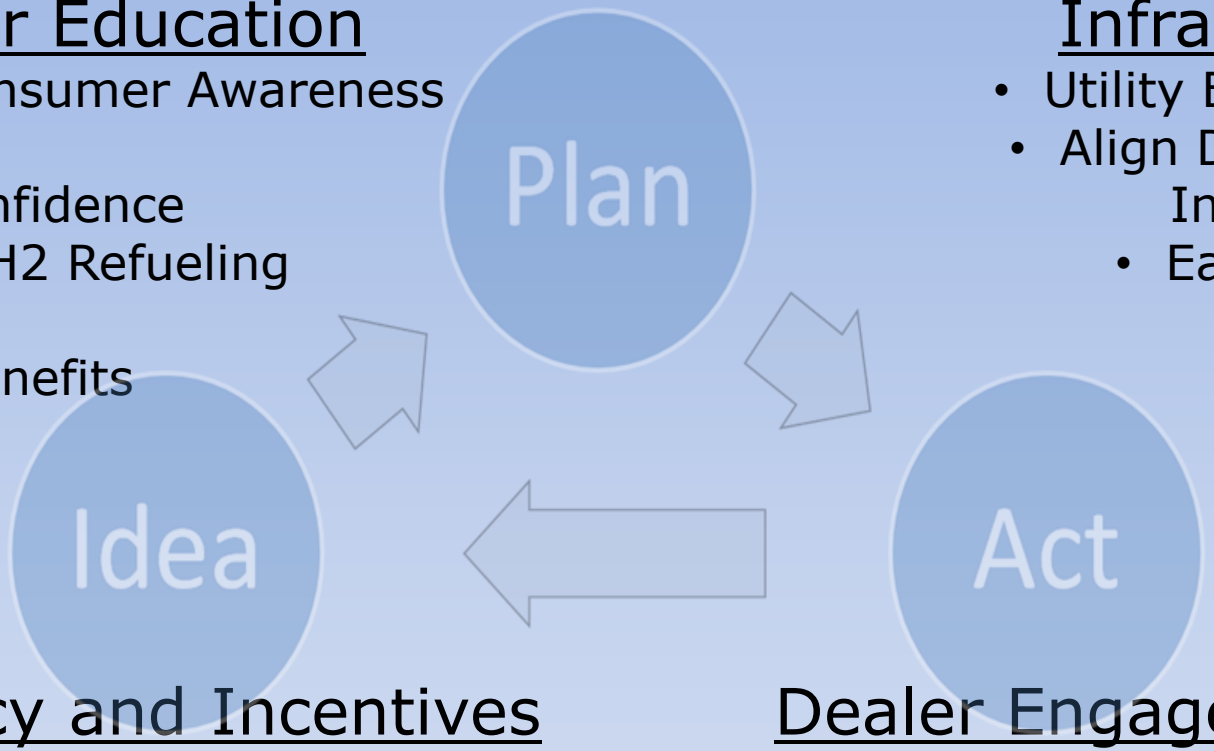
Consumer Education

Increase Consumer Awareness About:

- Range Confidence
- Charger/ H2 Refueling Locations
- Vehicle Benefits
- Incentives

Infrastructure

- Utility Engagement
- Align Demand and Infrastructure
- Easy Payment Systems



State Policy and Incentives

- Model Legislation
- Build Alliances
- Signage Practices

Dealer Engagement

- Find ZEV Champions
- State Dealer Association Engagement
- Assess Best Practices and Provide Dealer Training

2015 2020 2025 2030 2050

Today's Discussion

What actions would have the most impact to drive significant growth in the ZEV market and increase ZEV vehicle miles driven?